UTILITY PATENT APPLICATION TRANSMITTAL (Only for new nonprovisional applications under 37 CFR 1.53(b))	Attorney Docket No.	990812A	Total Pages	3
	First Named Inventor or Application Identifier			
	Makoto SAITO			
Check Box, if applicable [ ] Duplicate	Express Mail Label No.			
	PAGE 1 OF 3			

APPLICATION ELEMENTS FOR: METHOD FOR CONTROLLING DATA BASE COPYRIGHTS	ADDRESS TO: Assistant Commissioner for Patents BOX PATENT APPLICATIONS Washington, D.C. 20231

jc564 U.S. PTO 09/544497 04/07/00

1. [X] Fee Transmittal Form (Incorporated within this form)
   (Submit an original and a duplicate for fee processing)

2. [X] Specification Total Pages [25]

3. [X] Formal Drawing(s) (35 USC 113) Total Sheets [2]

4. [X] Oath or Declaration Total Pages [2]

   a. [--] Newly executed (original)

   b. [X] Copy from prior application (37 CFR 1.63(d)) (for continuation with Box 17 completed).

      i. [--] Deletion of Inventor(s)
      Signed statement attached deleting inventor(s) named in prior application, see 37 CFR 1.63(d)(2) and 1.33(b).

5. [X] Incorporation by reference (usable if box 4b is checked)
   The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.

6. [--] Microfiche Computer Program (Appendix)

7. [--] Nucleotide and/or Amino Acid Sequence Submission (if applicable, all necessary)

   a. [--] Computer Readable Copy
   b. [--] Paper Copy (identical to computer copy)
   c. [--] Statement Verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

8. [X] Assignment Papers (cover sheet and document(s)) (Assignment of prior application S.N. 08/895,493 and of parent application S.N. 08/416,037 to Mitsubishi Corporation has been recorded at Reel 7620, Frame 0817).

9. [--] 37 CFR 3.73(b) Statement (when there is an assignee) [X] Power of Attorney

UTILITY PATENT APPLICATION TRANSMITTAL (Only for new nonprovisional applications under 37 CFR 1.53(b))	Attorney Docket No.	990812A
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10. [-] English translation Document (if applicable)
11. [X] Information Disclosure Statement [--] Copies of IDS Citations
12. [X] A Preliminary Amendment is enclosed herewith. See also, Item 17 (A) & (B) below.
13. [X] Return Receipt Postcard (MPEP 503)
14. [-] Small Entity Statement(s) [--] Statement filed in prior application Status still proper and desired.
15. [X] Claim for Convention Priority [X] Certified copy of Priority Document(s)

    a. Priority of Japanese application no. 6-64889 filed on April 1, 1994 is claimed under 35 USC 119. The certified copy has been filed in prior application Serial No. 08/416,037. (For Continuing Applications, if applicable).

16. [-] Other _____

17. [X] If a CONTINUING APPLICATION, check appropriate box and supply the requisite information:
    [X] Continuation [--] Division [--] Continuation-in-part (CIP) of prior application no. 08/895,493

    a. [X] Please amend the specification by inserting after the title: --This application is a Continuation of prior application Serial No. 08/895,493 filed July 16, 1997, which is a Continuation of prior application Serial No. 08/416,037 filed March 31, 1995.--

    b. [X] Cancel in this application original claims 1-22 of the prior application before calculating the filing fee.

FEE TRANSMITTAL The filing fee is calculated below	Number Filed	Number Extra	Rate	Basic Fee $690.00
Total Claims	30 - 20	10	-- x $18.00	180.00
Independent Claims	1 - 3	0	-- x $78.00	
Multiple Dependent Claims			$260.00	260.00
			Basic Filing Fee	440.00
Reduction by 1/2 for small entity				
Fee for recording enclosed Assignment			$40.00	
TOTAL				$ 1,130.00

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[X] A check in the amount of $1,130.00 is enclosed to cover the filing fee.

[X] The Commissioner is hereby authorized to charge payment for any additional filing fees required under 37 CFR 1.16 or credit any overpayment to Deposit Account No. **01-2340**. A duplicate of this sheet is attached.

18. CORRESPONDENCE ADDRESS

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SUBMITTED BY

Typed or Printed Name John P. Kong Reg. No. 40,054

Signature  Date: April 7, 2000

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Rule 53(b) Continuation Application
of Serial No. 08/895,493

Makoto SAITO

Serial Number: Not Yet Assigned — Group Art Unit: 2766 (prior)

Filed: **Herewith** — Examiner: H. Sayadian (prior)

For: **METHOD FOR CONTROLLING DATA BASE COPYRIGHTS**

PRELIMINARY AMENDMENT

Assistant Commissioner of Patents
Washington, D.C. 20231

April 7, 2000

Sir:

Please amend the above-captioned Continuation patent application as follows:

IN THE CLAIMS:

Please **CANCEL** Claims 1-22 without prejudice or disclaimer of the subject matter recited therein.

Please **ADD** New Claims 23-50 as follows:

23. A digital data management method, comprising the steps of:

encrypting digital data to produce encrypted digital data supplied to a user;

using a utilization permit key to manage said digital data, said utilization permit key being a display permit key, an edit permit key, a storage permit key, a copy permit key, and/or a transfer permit key;

decrypting said encrypted digital data to decrypted digital data by using said display permit key, and displaying said decrypted digital data;

decrypting said encrypted digital data to decrypted digital data by using said edit permit key, and editing said decrypted digital data;

decrypting said encrypted digital data to decrypted digital data by using said storage permit key, encrypting again said decrypted digital data to encrypted digital data by using said storage permit key, and storing said encrypted digital data;

decrypting said encrypted digital data to decrypted digital data by using said copy permit key, encrypting again said decrypted digital data to encrypted digital data by using said copy permit key, and copying said encrypted digital data; and

decrypting said encrypted digital data to decrypted digital data by using said transfer permit key, encrypting again said decrypted digital data to encrypted digital data by using said transfer permit key, and transferring said encrypted digital data.

24. A digital data management method according to claim 23, wherein said step of encrypting said digital data uses a crypt key specific to said digital data.

25. A digital data management method according to claim 23, wherein said step of encrypting said digital data uses a crypt key not specific to said digital data.

26. A digital data management method according to claim 23, wherein:

said utilization permit key is hierarchized; and

said utilization permit key at an upper hierarchy level includes a function of said utilization permit key at a lower hierarchy level.

27. A digital management method according to claim 26, wherein said transfer permit key is said utilization permit key at the highest hierarchy level.

28. A digital data management method according to claim 26, wherein said edit permit key is said utilization permit key at the highest hierarchy level.

29. A digital data management method according to claim 23, wherein:

said encrypted digital data is decrypted to decrypted digital data only when said digital data is displayed or edited; and

said decrypted digital data, when stored, copied or transferred, is encrypted again to said encrypted digital data.

30. A digital data management method according to claim 23, wherein:

said encrypted digital data is, when displayed or edited, decrypted to said decrypted digital data; and

said decrypted digital data is, when stored, copied or transferred, encrypted again to said encrypted digital data.

31. A digital data management method according to claim 23, further comprising a step of using a copyright management program for managing utilization of said digital data.

32. A digital data management method according to claim 31, wherein said copyright management program is included in said utilization permit key.

33. A digital data management method according to claim 31, wherein a crypt key is added to said copyright management program.

34. A digital data management method according to claim 31, 32 or 33, wherein said copyright management program is encrypted to an encrypted copyright management program.

35. A digital data management method according to claim 34, wherein said encrypted copyright management program is decrypted by using said utilization permit key.

36. A digital data management method according to claim 31, wherein said copyright management program is separate from said digital data.

37. A digital data management method according to claim 31, wherein said copyright management program is integrated with said digital data.

38. A digital data management method according to claim 23, wherein said utilization permit key includes a crypt key.

39. A digital data management method according to claim 31, wherein said copyright management program includes said crypt key.

40. A digital data management method according to claim 38 or 39, wherein said crypt key is encrypted.

41. A digital data management method according to claim 23, wherein copyright information is added to said digital data.

42. A digital data control method according to claim 41, wherein said copyright information includes original copyright information and edit copyright information added to said digital data by a copyright management program.

43. A digital data management method according to claim 41, wherein said copyright information is added in a file body of said digital data.

44. A digital data management method according to claim 41, wherein said copyright information is added in a file header of said digital data.

45. A digital data management method according to claim 41, wherein said copyright information is added in said copyright management program.

46. A digital data management method according to claim 45, wherein said copyright management program is added in a file body of said digital data.

47. A digital data management method according to claim 41, wherein said digital data without said copyright information cannot be utilized.

48. A digital data management method according to claim 47, wherein utilization of said digital data is managed by a copyright management program.

49. A digital data management method according to claim 47, wherein said digital data without said copyright information is encrypted again to said encrypted digital data by using said utilization permit key.

50. A digital data management method according to claim 47, wherein said digital data without said copyright information is encrypted again to said encrypted digital data by a copyright management program.

REMARKS

By this Preliminary Amendment, claims 1-22 were cancelled without prejudice or disclaimer. New claims 23-50 were added. Early consideration and allowance of claims 23-50 are earnestly solicited.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney, at the telephone number indicated below, to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees which may be due with respect to this paper, may be charged to Deposit Account No. 01-2340.

Respectfully submitted,

ARMSTRONG, WESTERMAN, HATTORI,
McLELAND & NAUGHTON

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UNITED STATES PATENT APPLICATION

FOR

METHOD FOR CONTROLLING DATABASE COPYRIGHTS

BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

The present invention relates to a method for controlling copyrights on utilizing, storing, copying, editing and transferring of digital data, and in particular, to an application of the method to a multimedia system.

2. BACKGROUND ART

In the information oriented society of today, database systems are becoming wide spread in which it is possible to use various types of data, stored independently by each computer in the past, by connecting computers via communication lines.

In such a database system, the information handled up to this point has been conventionally coded information that can be processed by computer, and that contains a relatively small amount of information and monochrome binary data, such as facsimile information at the most. It is not possible to handle data containing a relatively large amount of information, such as data for natural pictures or animation.

With the rapid progress of digital processing techniques for various types of electrical signals, a technique is under development for digital processing of picture signals other than binary data, handled only as analog signals in the past.

By digitizing the picture signal, it is possible to handle a picture signal, such as television signal, by computer. As a technique of the future, attention is now focused on "multimedia systems", which can simultaneously handle the data processed by computers and digitized picture data. Because the

picture data contains an overwhelmingly large amount of information compared with character data and audio data, it is difficult to store, transfer or process the picture data by computer. For this reason, techniques for compressing and expanding picture data have been developed. Further, several standards for compression/expansion of picture data have been established. For example, the following standards have been established as common standards: JPEG (Joint Photographic image coding Experts Group) standards for still pictures, H.261 standards for television conferences, MPEG1 (Moving Picture image coding Experts Group 1) standards for picture accumulation, and MPEG2 standards to cope with current television broadcasting and high definition television broadcasting. By implementing these new techniques, it is now possible to transmit digital picture data in real time.

For analog data, which has been widely used in the past, the control of copyrights during processing has not been an important issue because the quality of the analog data deteriorates each time the data is stored, copied, edited or transferred. However, the quality of digital data does not deteriorate even when the data is repeatedly stored, copied, fabricated or transferred. Therefore, the management and control of copyrights during processing of digital data is an important issue.

Up to now, there has been no adequate method for management and control of copyrights for digital data. It has been managed and controlled merely by copyright law or by contracts. In copyright law, only compensation for digital sound and picture recording devices has been prescribed.

It is possible not only to refer to the content of a database, but also to effectively utilize the data obtained from the database by storing, copying or editing the data, and also transferring the edited data to other persons or to the database with the edited data registered as new data.

In a conventional database system, only character data is handled. However, in multimedia systems, sound data and picture data, originally generated as analog data, is digitized and used as part of the database in addition to the other data in the database, such as character data.

Under such circumstances, it is an important question as to how to handle copyrights of the data in the database. However, there are no means in the prior art for copyright management and control of such actions as copying, editing, transferring, etc., of data.

A system for executing copyright control by using encrypted data and obtaining a permit key from a key control center via public telephone lines is disclosed in Japanese Patent Application 4-199942 (US-08/098415) and Japanese Patent Application 4-289074 (US-08/143912) of the present inventors. A device for this purpose is disclosed in Japanese Patent Application 4-276941 (US-08/135634), also of the present inventors.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a method for controlling copyrights in the display (including the process of providing sound), storage, copying, editing and transfer of digital data in a database system including real time transmission of digital pictures.

For the control of copyrights in the database system to which the present invention is applied, it is essential to transmit one or more copyright control messages with copyright information and a program for controlling copyrights, when necessary, in addition to a key for enabling users who wish to use encrypted data.

The copyright control message is displayed on a screen and advises or warns the user if the data is being utilized in a manner inconsistent with the conditions of the user's request or permission. The copyright control program watches and controls data use so that the data is not utilized beyond the conditions of the user's request or permission.

The copyright control program, the copyright information and the copyright control message are supplied together with a permit key in some cases, but they may also be supplied together with data in other cases. It is also possible to supply a part of them together with the permit key, and to supply the other part with the data.

For the data, the permit key, the copyright control message, the copyright information and the copyright control program, there are the following three cases: they are transmitted in encrypted form and decrypted upon use; they are transmitted in encrypted form and decrypted only when they are displayed; or they are not encrypted at all.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1A and Fig. 1B illustrate examples of display messages of the present invention.

Fig. 2A and Fig. 2B illustrate structures for television signals.

Fig. 3A to Fig. 3J illustrate embodiments of the present invention.

DETAILED DESCRIPTION

In the following, description will be given on embodiments of the present invention.

In the prior patent applications mentioned above, it is assumed that a permit key obtaining route is different from a data obtaining route as shown in Fig. 3A, and that the permit key is obtained from a key control center via public telephone lines. However, if a charging method is determined, it is possible to obtain the permit key via the communication system through which the database is supplied.

In the system of the prior patent applications, it is assumed that the permit key for secondary exploitation is used for distribution of the data selected for secondary exploitation. Secondary exploitation involving the storing, copying, editing, transferring, etc. of data is not included in the assumption. Also, it is assumed that the data is distributed only inside a LAN to which the users belong. Distribution outside the LAN is not part of the assumption. Therefore, the system is not adequate to cope with secondary exploitation unless the users choose to honor the copyright.

To cope with various forms of the secondary exploitation as described above, a plurality of permit keys are prepared to match each form of use, and no utilization is possible unless there is a permit key suitable for the desired form of use. As to the forms of use available for a database, there are display, storage, copying, edit, transfer, etc. The permit keys suitable for these forms of use should be prepared. However, in the case where the ability to execute several forms of use at the same time is desired, it is necessary to obtain a plurality of permit keys. If the user fails to obtain the permit keys, the desired form of use may not be executed.

To avoid such situations, a permit key can be used which makes it possible to execute several forms of use. Hierarchical permit keys can be used such that an upper level key also fulfills the function of a lower level key. For example, from lower level to upper level, the hierarchy is defined as: display < storage < copying < edit < transfer. With the display permit key, only display operations can be executed. Display and storage operations can be executed by the storage permit key. Display, storage and copying operations can be executed by the copying permit key. Display, storage, copying and edit operations can be executed by the edit permit key. Display, storage, copying, edit and transfer operations can be executed by the transfer permit key.

In the prior patent application, i.e. Japanese Patent Application 4-276941 (US-08/135634), the present inventors have proposed a system in which a plurality of encrypted data files, each encrypted by a plurality of different encryption keys, are recorded (stored) in encrypted form. The data files are then decrypted when they are displayed or edited, for instance, in a system where the storage permit key is the lowest level key.

By applying this system, it is possible to order key hierarchy from lower-level to upper-level in the order of: storage < copying <transfer < display < edit. Specifically, the order is set in such manner that storage operations can be executed by a storage permit key; storage and copying operations can be executed by a copying permit key; storage, copying and transfer operations can be executed by a transfer permit key; storage, copying, transfer and display operations can be executed by a display permit key; and storage, copying, transfer, display and edit operations can be executed by an edit permit key.

In this system, storage, copying and transfer are placed at a lower level than display because, even when storage, copying and transfer operations are executed on the data, it is difficult and meaningless to utilize the data since it

cannot be displayed It is necessary to execute display in order to utilize the data. This hierarchical arrangement is best suited to a system, in which encrypted data are supplied and are utilized using a permit key.

The permit key is usually offered to the user on payment basis. Therefore, except where data utilization is unlimited, the number of times the permit key may be used is limited to one time or several times if it is necessary to limit the number of times the data is used.

Because the data can be used if there is a permit key, it is possible to use the data beyond the permitted range if the permit key is duplicated or falsified. To prevent this, the permit key is encrypted.

The use of data includes storage, display, copying, edit, transfer, etc. thereof, which are necessary to be allowed or prohibited.

In the case where it is necessary to limit the number of usage times or to limit forms of use, it is desirable to display a message for such purpose.

In the case where the information under copyright is falsified, the data supplier or the user may suffer damages. This must be prevented.

To ensure complete copyright control, information on the original copyright and information on secondary and tertiary copyrights for the edition of the data are given to the data.

The above copyright control is executed by the copyright control program.

In a conventional database system, the data itself is offered in a completely defenseless state. Therefore, copyright control can be executed

only when data is taken out of the database. In the subsequent copyright control, there is no other way but to rely on conscience of the user and to take necessary measures when the data is utilized beyond the permitted range of use.

For this reason, as described in the prior patent application, i.e. Japanese Patent Application 4-276941 (US-08/135634), the data supplied from the database are left in an encrypted state, and storage is executed under this condition. In addition, copying and transfer are also executed in the encrypted state. Decrypting is performed only in display and edit operations, and these are controlled by the copyright control program. In so doing, it is impossible to use the data beyond the permitted range. In this case, the copyright control program may be integrated with the data or may be encrypted.

Because the copyright control program is encrypted and the permit key decrypts the copyright control program, and because the copyright control program decrypts and encrypts the data, the data is encrypted twice.

In this case, if a key unique to the data is added to the copyright control program for the purpose of encrypting the data, it is impossible to decrypt the data if the copyright control program is separated from the data.

In this copyright control program, even if the data is stored, copied or transferred within the permitted range of use, and if these operations are executed after the data and the copyright program have been encrypted, it is impossible to use the data in an undesired manner.

If an operator uses a computer program inadequately and, as a result, the computer does not respond any more or computer operation is stopped, an error message is displayed so that the operator may know the cause.

Similarly, if a user of the database erroneously uses the data beyond the permitted range of the permit key, and, as a result, the computer does not respond or operation is stopped, the user cannot understand the cause. In this case, a copyright control message is displayed just as an error message is displayed by the copyright control program.

The display of the copyright control message as described above also fulfills the function of providing a warning if the user intentionally uses the data beyond the range of use permitted by the permit key.

In general, various programs are incorporated into read-only memory (ROM) inside the equipment which the user uses, or the programs are supplied from software. When the programs are incorporated into ROM, there is no possibility that the programs may be changed. However, the equipment to be used is limited to systems that contain the ROM. On the other hand, when the programs are supplied from software, there is no system limitation if the programs are transferred. However, there is a possibility that the programs may be altered.

The database is utilized by various users using various types of devices. Therefore, if the programs for controlling copyrights are supplied as software, it is necessary to cope with various types of devices. Further, alteration of the programs must not be possible. Therefore, the copyright control program should be encrypted to prevent such trouble. In this case, it is necessary to modify the program according to the device that the user uses. A program to translate the copyright control program is provided in the communication software of the device which the user uses. The copyright control program can then be translated by the translation program so that it suits the device.

Even though the permit key for using the database may become more complicated due to encryption, a data size of several tens of bites is sufficient.

Therefore, th. time required for transmitting the permit key is far shorter than one second. In other words, even when a payment-based public telephone line is used and other information is transmitted together with the permit key, the increase of cost is negligible.

Therefore, when transmitting the permit key as shown in Fig. 3B, utilizing surplus time, the copyright control program can be transmitted.

The copyright control program can be supplied together with the permit key and also together with the data as shown in Fig. 3C.

In this case, the copyright control program is supplied together with the data, and the entire data utilization process is placed under control of the copyright control program. For example, the data supplied in encrypted form cannot be decrypted unless the copyright program supplied with it is used. If there is no such copyright control program, the data cannot be used. Thus, the control of copyrights is reinforced. Also, integration of the copyright control program with the data further reinforces copyright control.

The following are some examples of the copyright control message:

"Need a display permit key."
"Need a storage permit key."
"Need a copying permit key."
"Need an edit permit key."
"Need a transfer permit key."

Some other examples are:

"Display unavailable."
"Storage unavailable."

"Copy unavailable."

"Edit unavailable."

"Transfer unavailable."

These copyright control messages are displayed alone as shown in Fig. 1A or in combination as shown in Fig. 1B.

Next, description will be given on supply of the copyright control message.

To display the copyright control message, the message must be stored in the memory of the device which the user uses. The memory in the device is classified as ROM and random-access memory (RAM).

The method of storing the messages in ROM is reliable, but there is a limitation to the device because the user must use the ROM wherein the copyright control messages are stored.

As for methods for storing messages in RAM, there is a method for supplying messages together with the permit key, a method for supplying messages together with the copyright control program, and a method for supplying messages together with the data. When the permit key and the copyright control program are supplied at the same time, the copyright control message can also be supplied at the same time.

The copyright control message is not effective unless an adequate message is displayed. For this reason, the copyright control message cannot play its designed role if the message is changed in such a manner that no substantial content is displayed, or further, if its content is deleted such that nothing is displayed. To prevent this trouble, the message is encrypted.

The display of the copyright control message is executed by the copyright control program. The modes of display are as follows. (1) When an operation is attempted with no adequate key available, a corresponding message is displayed. (2) All messages corresponding to operations available for the current permit key are displayed, if an operation is attempted without an available permit key.

The copyright control message is supplied together with the permit key as shown in Fig. 3D, or together with the data as shown in Fig. 3E.

The copyright control message is transmitted by transmitting all messages or only the necessary messages required. In the former case, the quantity of information is relatively large, but security is high. In the latter case, the quantity of information is relatively small, but security is low.

It is desirable that the copyright control message be inseparable from the data, as in the case of the copyright control program. This may be facilitated by integrating the copyright control message with the copyright control program.

To display the copyright on printed matter, the name of the author and the date are used. The copyright of the database is displayed by entering information such as the name of the author and the date.

As described above, edit and up-load of edited data are included in the use of the data in the database. Specifically, the presence of secondary data, which is edited from the data, i.e. a work of authorship, is recognized. To ensure the copyright of the data in this context, it is necessary to store the information on original authorship and secondary authorship together with the data. In case the data is used in a manner other than for down-loading and display, copyright information including information on the operator, in

addition to the copyright information stored up to that moment, is stored together with the data as history.

In this case, only the person who controls the database can put the original authorship into the database as primary data. All data handled by other than the person in charge of database control is considered secondary data. Control of the data history is therefore further reinforced.

When the copyright information is separated from data which is a work of authorship, it becomes extremely difficult to recognize the copyright. Thus, it is necessary that the copyright information be inseparable from the data.

To prevent separation of the copyright information from the data, a method for integrating the data with the copyright information or a method for making the data unusable without copyright information are described. These methods are similar to the methods described above for the copyright control program and the copyright control message.

First, description will be given for a method for integrating the data with the copyright information.

The data handled by computer comprises a file header indicating data name and size, and a file body, which comprises the main body of data. Therefore, for integrating the data with the copyright information, there are methods that integrate the copyright information with the file header, that integrate the copyright information with the file body, and that take other means for the purpose.

Among these methods, the method that integrates the copyright information with file header is available even without a file header if the

character information is expressed with character code. Thus, it is a simple method, but not very reliable. Also, because the capacity of the file header is not high, it is not sufficient if there is a large amount of copyright information.

Digital picture data and digital sound data are grouped together under a common group header. The copyright information can be integrated into this group header. However, there is a problem of header capacity similar to the case for the file header.

For the method of integrating the copyright information with the file body, one way is to add copyright information for each edited piece of data. Another way is to add the copyright information all together.

To add the copyright information for each edited piece of data, the copyright information is added to each piece of data using a cut-and-paste procedure. This is not only complicated but disadvantageous in that the entire file data becomes too big.

If the picture data indicates the copyright of original authorship, it is easy to identify corresponding data. Thus, it is not always necessary to add the copyright information to each minimum unit of the edited data.

It is also possible to write the copyright information into the copyright program. In this method, it is difficult to manipulate the copyright information if it is written into the copyright control program integrated with the data as already described.

If the data is a picture signal, it is necessary to have synchronization signal data in order to define scanning line, field and frame. This synchronization signal has high redundancy and is generally represented

with variable-length code. Thus, the copyright information can be mixed with the variable-length code. The number of scanning lines is 480 for VGA standards. By utilizing this method, a considerable quantity of information can be mixed into it.

In case the picture data is an animated picture, it is possible to write a sufficient quantity of copyright information in this method. However, if the picture data is a still picture edited by a cut-and-paste procedure, there may not be enough space to add the copyright control information.

Fig. 2A and Fig. 2B represent structures for an analog television signal and a digital television signal. Fig. 2A represents an analog television signal, and Fig. 2B shows a digital television signal.

A signal containing other than picture data, such as the multiplex teletext signal in analog television, is inserted by utilizing the vertical retrace interval. The horizontal retrace interval is not utilized.

In contrast, in digital television, it is possible for a copyright control program or other multiplex teletext signal to be placed into horizontal scanning data or into vertical scanning data.

As a method for integrating the copyright information with data, one way is to write the copyright information into the data itself, and another is to write it into control code.

With the data used in computer, there is control code for controlling the communication system or computer system in addition to the data to be displayed on screen or used for some operation,. This control code cannot be seen by the user. Therefore, if the copyright information is written into the

control code, the copyright information thus written does not cause trouble for the user.

It is also possible to enter into the files of the computer using the technique of a computer virus without affecting the operation itself.

The copyright information may be supplied together with the permit key as shown in Fig. 3F or may be supplied together with data as shown in Fig. 3G.

Attention has been focused in recent years on digital signatures. Using a private key, which only the person concerned knows, and a public key, which other persons also know, a digital signature is prepared from the private key and from the data on the file size of the document. If the document is changed, the change can be confirmed by the private key, and the content of the document can be seen at any time by other persons using the public key. Thus, this scheme offers very high security.

The data in a computer can be changed without leaving any trace. Because of this, an author may not notice that his copyright is infringed, or a user may use the data without knowing that the content of the data has been changed, and the author or user may suffer damages. To prevent this, a digital signature is attached to the data, and damage to the copyright owner or the user can be avoided.

The permit key, copyright control program, copyright control message, and copyright information can be combined in any way as necessary to actualize the method for controlling database copyrights.

Also, it is possible to design in such a manner that only a part of the data of the copyright control program, the copyright control message or the

copyright information is supplied together with the permit key as shown in Fig. 3H, 3I and 3J, and that the other part is supplied together with the data. The part supplied with the permit key and the part supplied together with the data are then combined, the function of the complete permit key being served after they have been combined together.

Thus, it is possible to give the function of the permit key to the copyright program and copyright control message, and higher security is ensured.

WHAT WE CLAIM IS:

1. A method for controlling copyright of digital data encrypted and supplied from a database to a user, wherein:

a utilization permit key including a decryption key for said digital data is supplied from a key control center to said user;

said utilization permit key comprising at least one of the following:

a display permit key for displaying said digital data, an edit permit key for editing said digital data, a storage permit key for storing said digital data, a copy permit key for copying said digital data, a transfer utilization permit key for transferring said digital data; and

said user decrypts said digital data using said permit key and performs at least one of the following operations as provided by said utilization permit key:

displays said digital data, edits said digital data, stores said digital data, copies said digital data, transfers said digital data.

2. The method for data copyright control according to claim 1 wherein a digital signature is given to said digital data.

3. The method for data copyright control according to claim 1 wherein at least one of the following copyright control elements is used in addition to each of said permit keys:

a copyright control program for controlling copyright of said digital data;

copyright information for copyright of said digital data;

a copyright control message for use of said digital data under copyright.

4. The method for data copyright control according to claim 3 wherein said copyright information is stored, copied and transferred together

with said digital data when said digital data is stored, copied and transferred respectively.

5. The method for data copyright control according to claim 3 wherein history information for edit, copy and transfer of said digital data is added to said copyright information when any one of said storing, copying and transferring operations is performed on said digital data.

6. The method for data copyright control according to claim 1 wherein at least one of said permit keys of which said utilization permit key is comprised is encrypted.

7. The method for data copyright control according to claim 6 wherein said encrypted data is decrypted by said copyright control program.

8. The method for data copyright control according to claim 3 wherein said copyright control program is encoded.

9. The method for data copyright control according to claim 3 wherein at least one of said copyright control elements is supplied together with said utilization permit key.

10. The method for data copyright control according to claim 3 wherein:

at least one of said copyright control elements is supplied together with said encrypted data from the database; and

said utilization permit key is supplied from said key control center.

11. The method for data copyright control according to claim 3 wherein:

a first part of at least one of said copyright control elements is supplied together with said encrypted data from the database; and

a second part of at least one of said copyright control elements is supplied together with said permit key from said key control center.

12. A method for controlling copyright of digital data encrypted and supplied from a database to a user, wherein:

a permit key including a decoding key for said digital data is supplied from a key control center to said user;

said permit key comprising at least one of the following use permit keys:

a display permit key for displaying said digital data, an edit permit key for editing said digital data, a storage permit key for storing said digital data, a copy permit key for copying said digital data, and a transfer permit key for transferring said digital data;

said user performs at least one of the following operations using said permit key:

displays said digital data, edits said digital data, stores said digital data, copies said digital data, transfers said digital data;

said digital data encrypted is decrypted when said digital data is displayed and edited; and

said digital data is encrypted again when said digital data is subjected to one of the following operations: storing, copying, transferring.

13. The method for data copyright control according to claim 12 wherein a digital signature is given to said digital data.

14. The method for data copyright control according to claim 12 wherein at least one of the following copyright control elements is used in addition to each of said permit keys:

a copyright control program for controlling copyright of said digital data;

copyright information for copyright of said digital data; and

a copyright control message for using said digital data under copyright.

15. The method for data copyright control according to claim 14 wherein said copyright information is stored, copied and transferred when said digital data is stored, copied and transferred respectively.

16. The method for data copyright control according to claim 14 wherein history information for edit, copy and transfer of said digital data is added to said copyright information when said digital data is edited, copied and transferred respectively.

17. The method for data copyright control according to claim 12 wherein at least one of said use permit keys of which said permit key is comprised is encrypted.

18. The method for data copyright control according to claim 17 wherein encryption of said digital data is decrypted by said copyright control program.

19. The method for data copyright control according to claim 14 wherein said copyright control program is encrypted.

20. The method for data copyright control according to claims 14 wherein at least one of said copyright control elements is supplied together with said permit key.

21. The method for data copyright control according to claim 14 wherein at least one of said copyright control elements is supplied together with said digital data encrypted from the database; and

said permit key is supplied from said key control center.

22. The method for data copyright control according to claim 14 wherein a first part of at least one of said copyright control elements is supplied together with the digital data encrypted from the database; and

a second part of said at least one copyright control element is supplied together with said permit key from said key control center.

ABSTRACT OF THE DISCLOSURE

The present invention provides a method for controlling copyrights of digital data in a database system including real time transmission of a digital picture. Copyrights are controlled using one or more of the following, as necessary, in addition to a permit key: a copyright control program, copyright information or copyright control message. The copyright control program, the copyright information and the copyright control message are supplied together with the permit key, or they are supplied together with the data. Otherwise, a part of them is supplied together with the permit key and the other part of them is supplied together with the data. The data, the permit key, the copyright control message, the copyright information and the copyright control program are (1) transmitted while encrypted, but are decrypted when used, or (2) they are transmitted while encrypted and decrypted for display only, otherwise remaining encrypted, or (3) they may not be encrypted at all.

FIG. 1A

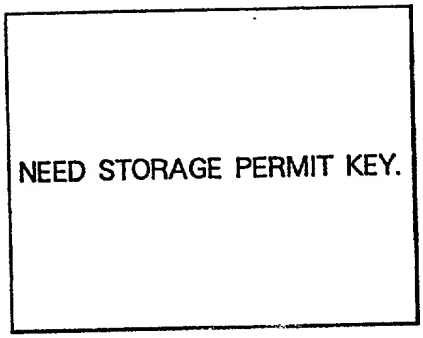


FIG. 1B

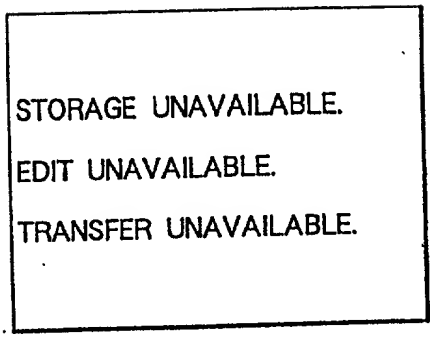


FIG. 2A

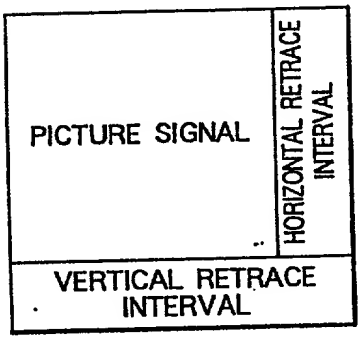
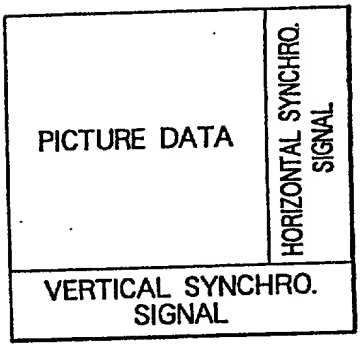


FIG. 2B



KEY CONTROL CENTER DATABASE

FIG. 3A

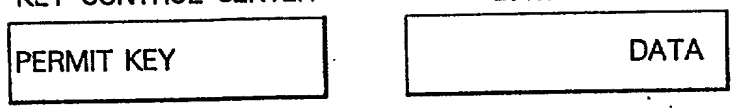


FIG. 3B

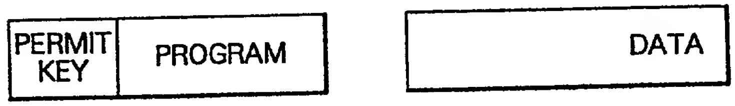


FIG. 3C

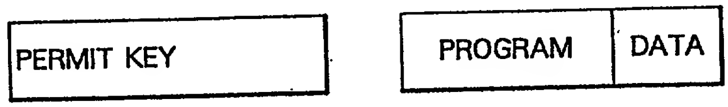


FIG. 3D

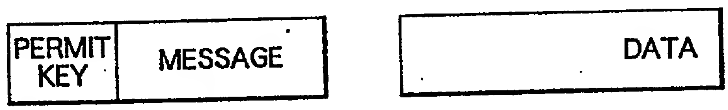


FIG. 3E

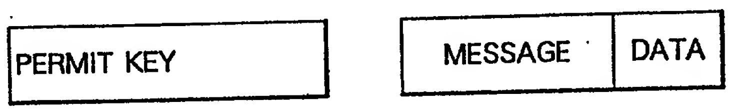


FIG. 3F

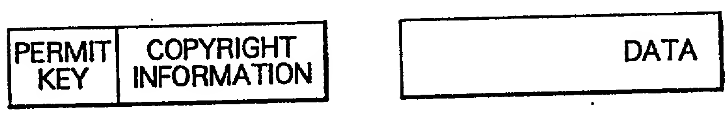


FIG. 3G

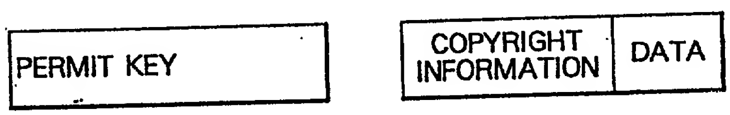


FIG. 3H

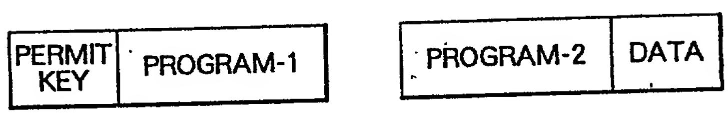


FIG. 3I

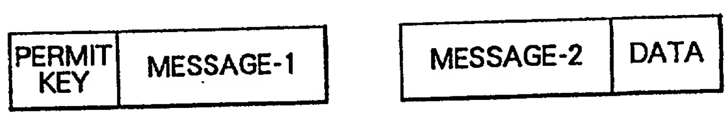
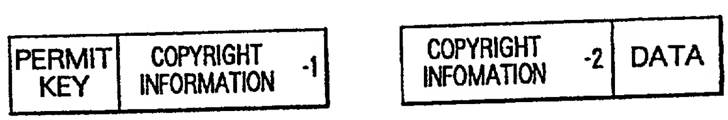


FIG. 3J



Docket No. 990812

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of: Makoto SAITO

Serial No.: 08/895,493

Filed: July 16, 1997

For: METHOD FOR CONTROLLING DATABASE COPYRIGHTS

REVOCATION OF POWER OF ATTORNEY AND NEW APPOINTMENT

Assistant Commissioner for Patents
Washington, D.C. 20231
Sir:

The undersigned, assignee of the entire interest in and to the above-identified United States patent application, recorded on May 22, 1995 at Reel 7620, Frame 0817, hereby revokes all powers of attorney previously given and appoints:

> William F. Westerman, Reg. No. 29,988; Ken-Ichi Hattori, Reg. No. 32,861; William G. Kratz, Reg. No. 22,631; Le-Nhung McLeland, Reg. No. 31,541; James P. Welch, Reg. No. 17,379; Ronald F. Naughton, Reg. No. 24,616; Mel R. Quintos, Reg. No. 31,898; Donald W. Hanson, Reg. No. 27,133; Stephen G. Adrian, Reg. No. 32,878; William L. Brooks, Reg. No. 34,129; John F. Carney, Reg. No. 20,276; Edward F. Welsh, Reg. No. 22,455; John P. Kong, Reg. No. 40,059; and Raymond J. Ho, Reg. No. 41,838.

as principal attorneys to prosecute said application and to transact all business in the Patent and Trademark Office connected therewith.

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MITSUBISHI CORPORATION

Date July 15 '97 By: Eisaku Tamura Eisaku Tamura

Title: General Manager, New Business Development Office

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below, next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

METHOD FOR CONTROLLING DATABASE COPYRIGHTS

the specification of which

_____ is attached hereto.
XX was filed on March 31, 1995 as
Application Serial No. 08/416,037
and was amended on _____
(if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above. I do not know and do not believe that the same was ever known or used in the United States of America before my invention thereof, or patented or described in any printed publication in any country before my invention thereof or more than one year prior to this application, that the same was not in public use or on sale in the United States of America more than one year prior to this application, and that the invention has not been patented or made the subject of an inventor's certificate issued before the date of this application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months prior to this application.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119, of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)			Priority Claimed	
6-64889 (Number)	Japan (Country)	1st, April, 1994 (Day/Month/Year Filed)	x Yes	No
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Section 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)	(Filing Date)	(Status -- patented, pending, abandoned)
(Application Serial No.)	(Filing Date)	(Status -- patented, pending, abandoned)

I hereby appoint HECKER & HARRIMAN, a firm including: Gary A. Hecker, Reg. No. 31,023; J. D. Harriman II, Reg. No. 31,967; and Christopher A. Mathews, Reg. No. 35,944 with offices located at 2029 Century Park East, Suite 1600, Los Angeles, California 90067, telephone (310) 286-0377, my attorneys with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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